Effect of Acupressure on Physical and Psychological Health Status of Elderly with Knee Joint Osteoarthritis

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Abstract:
Background: Acupressure is a type of complementary and alternative medicine that is currently recommended in osteoarthritis management. Acupressure can improve the mobility, self-care practices and quality of life of the elderly with knee osteoarthritis, reduce the elderly patient's dependence on conventional therapy and reduce the burden on society. Aim: Determine the effect of acupressure on physical and psychological health status of elderly with knee joint osteoarthritis. Design: Quasi-experimental research design was used in this study. Setting: The outpatient clinic of Rheumatology in Mansoura University Hospital. Subjects: This study was carried out on 104 elderly diagnosed with knee osteoarthritis and divided into two groups (study and control), fifty-two (52) subjects for each. Tools: Five tools were used in this study; structured interview schedule, western ontario and McMaster universities osteoarthritis scale, hospital anxiety and depression scale, older adult's knowledge related knee osteoarthritis and acupressure structured interview schedule, and acupressure training observational checklist. Results: The majority of the two groups were young old with the mean of age 64.46±4.10 and 65.85±4.54 years for the study and control groups respectively. The total mean score of physical health status (WOMAC score) and psychological health status (Anxiety and Depression) was improved significantly in the study group at post 1 and 2 of evaluation (p=0.000). A statistically significant difference was found between study and control groups regarding the physical and psychological health status of the elderly after the implementation of acupressure intervention program (p=0.000). Conclusion: The developed acupressure intervention program proved to be effective in improving knowledge and practices of the elderly with knee osteoarthritis. A significant improvement in the physical and psychological health status of the study group was found after the implementation of the acupressure intervention program. Recommendations: The developed illustrated acupressure intervention booklet to be distributed to elderly patients in Mansoura university hospitals rheumatology outpatient clinics through the responsible personal to raise their knowledge and practices.
Keywords: Acupressure, Physical status, Psychological status, Elderly, Knee osteoarthritis.

I. Introduction

Osteoarthritis (OA) is the most common musculoskeletal disease all over the world and knee osteoarthritis (KOA) is the most common form of arthritis [1,2]. KOA often called degenerative joint disease or wear and tear arthritis, in which cartilage and bones within the joint begin to breakdown. This condition usually begins slowly and get worse over time and it results in structural and functional limitation in the body that lead to disability [3,4,5]. The prevalence of knee osteoarthritis increasing with age due to normal physiological changes that occurs in musculoskeletal system with advancing age. According to the United Nations, by 2050 people aged over 60 will account for more than 20% of the world population. Of that 20%, a conservative estimate of 15% will have symptomatic osteoarthritis and one-third of these people will be severely disabled [6,7,8]. Reduced functional ability starts in the early phase of the disease and is progressive [9].

Pharmacological treatment may be effective in relieving symptoms of osteoarthritis but many elderly patients tend to seek for alternatives options which are more or equally effective but more safe than conventional treatment [10,11,12,13]. Complementary and Alternative Medicine (CAM) can be defined as health practices and products that are not considered to be a part of conventional medicine. Complementary medicine is used together with conventional medicine, while alternative medicine is used in place of conventional medicine. CAM may include yoga, Tai chi, massage, acupuncture and acupressure [14]. Acupressure is a type of complementary medicine that can be defined as non-invasive technique that includes applying pressure to specific points on the skin surface to stimulate the body's natural self-curative abilities that force the circulation throughout the body in order to restore the mind as well as body balance that is essential for physical and

spiritual wellbeing [15,16]. Moreover, health is considered a state of balance in body, maintained by a flow of life energy along specific meridians and disease is believed to occur when there is blockage in the flow of energy or when energy flow is deficient or in excess. When precise pressure is exerted into an acupoints, the gate is opened and Qi flow through [17].

Significance of the study:

Knee osteoarthritis (KOA) is the most leading cause of disability worldwide and the prevalence of KOA increased with advancing age due to increased life expectancy of elderly individuals [18]. The Framingham osteoarthritis study found that the prevalence of knee osteoarthritis in elderly less than 70 years was 27.4%, while those aged between 70 and 79 years was 34.1% and those aged 80 years and older was 43.7%. This fact means that the prevalence of KOA become evident among older population [19, 20]. According to the World Health Organization, about 5.5 million people suffer from osteoarthritis in Egypt, representing about 7% of the population [21]. KOA in elderly results in muscle weakness, decreased joint range of motion, joint instability, fatigue, stiffness, and pain. KOA also can lead to activity avoidance, muscle atrophy, difficulty in performing functional tasks involving ambulation and transfer, and reduced quality of life including both physical function and psychological status [22-26]. Elderly Patient with KOA not only have pain and functional limitation, but also may have psychological symptoms such as anxiety and depression that can exacerbate functional disabilities, affect adherence to treatment, act as a barrier to self-care and self-management behaviors, increased health care costs and mortality and decreased quality of life [27].

Complementary and alternative medicine is commonly used to manage joint pain among elderly persons with knee osteoarthritis due to many reasons including presence of comorbidities, normal age-related changes, and more adverse effect that may occur with conventional treatment [11]. Self-administered acupressure, if proven feasible and effective, can result in reduce knee osteoarthritis (KOA) symptoms, enhance healing process, promote relaxation and improve overall health. Also, acupressure can improve the mobility, self-care practices and quality of life of the elderly patient, reduce the elderly patient's dependence on conventional therapy that cause many side effects and reduce the burden on society [28]. So, it is very important to educate the elderly patients about acupressure in order to preserve function, reduce the dependence on conventional therapy, and reduces the burden on society and this is considered one of the gerontological nurse's role.

II. Aim of the study

The aim of this study was to determine the effect of acupressure on physical and psychological health status of elderly with knee joint osteoarthritis.

Research hypothesis:

Elderly with knee joint osteoarthritis who receive acupressure intervention will have improvement in physical and psychological health status than those who do not receive it.

III. Subjects and Method

Research design:

A quasi- experimental research design was used in this study.

Setting:

The study was carried out at outpatient clinic of rheumatology department in Mansoura University Hospital.

Subjects:

The study included 104 elderly patients divided into two groups (study and control), fifty-two (52) subjects for each. According to a previous study done in USA in 2012 by Zhang et al [22]., and based on the most important variable in the study, the sample size was calculated using https://www.dssresearch.com/KnowledgeCenter/toolkitcalculators/samplesizecalculators. Through enter average value for sample 1 equal 68.10 with SD 18.34 and average sample 2 equal 61.73 with SD 17.58 at confidence level 5% and statistical power 20%. So, the sample size was 98 for both samples and added 5% because of defaulter to become 104 for both samples. This sample was divided randomly and equally to two groups.

Inclusion criteria:
- Age 60 years and above
- Diagnosed with knee osteoarthritis for more than one year
- Able to communicate verbally and non-verbally
- Willing to participate in the study

Exclusion criteria:
- Elderly patients who have previous knee surgery
- Elderly patients with other type of arthritis
- Elderly patients who have complications of osteoarthritis

Tools: In order to collect the necessary data for the study five tools were used.

Tool I: Structured Interview sheet

This tool was developed by the researcher; it included two parts: **Part 1: Sociodemographic characteristics:** it included data such as age, sex, level of education, occupation, and income. **Part 2: Medical history:** it included data such as duration of illness, presence of other chronic condition, and treatment received.

Tool II: Western Ontario and McMaster Universities Osteoarthritis scale (WOMAC)

This tool was developed by Bellamy et al in 1988 [29] to assess the symptoms of pain, stiffness, and physical function in patients with knee osteoarthritis. The Arabic version of the scale developed by Guermazi et al in 2004 [30] was used. The reliability of this tool was tested using test retest reliability Spearman's correlation coefficient r = 0.84, 0.84, 0.92 for pain, stiffness and physical function subscales respectively. The scale is scored on a 5-point Likert scale: 0–4 for none, mild, moderate, severe, and extreme, respectively. The scores are summed for items in each subscale, converted into a percent score by dividing the total by the number of items, and multiplying the quotient by 100. Higher scores on the WOMAC indicate worse pain, stiffness, and functional limitations.

Tool III: Hospital Anxiety and Depression Scale (HADS)

This tool was developed by Zigmond & Snaith (1983) [31]. HADS is a self-report questionnaire commonly used to assess psychological health status. This scale was translated into Arabic and tested for its validity and reliability by Abd El-Hamid SH, 2010 [32]. This Arabic version was used in the present study. The reliability of this tool was tested using test retest reliability Spearman's correlation coefficient r=0.861. The HADS comprises statements which the patient rates based on their experience over the past week. The 14 statements are relevant to generalized anxiety (7 statements) or 'depression' (7 statements), the latter being largely (but not entirely) composed of reflections of the state of anaerobia. Each question has 4 possible responses. Responses were scored on a scale from 3 to 0. The two subscales, anxiety (HADS-A) and depression (HADS-D), have been found to be independent measures. In its current form the HADS is now divided into four ranges: normal (0–7), mild (8–10), moderate (11–15), and severe (16–21).

Tool IV: Older Adult's knowledge Related knee osteoarthritis and Acupressure Structured Interview Schedule

This tool was developed by the researcher after reviewing the relevant literatures. This was used to assess knowledge of the study subjects before and after conduction of the interventions. It included questions about knee osteoarthritis such as meaning of knee osteoarthritis, causes or risk factors, sign and symptoms and the types of management. It also included questions about acupressure such as types of complementary and alternative medicine, definition of acupressure, and benefits of acupressure. The total number of questions were seven (7), each question had a group of correct answers, each correct answer was given a score of one (1) and no answer was given a score of zero (0). The total score was 30. A score less than 15 indicated poor knowledge, a score of 15 to less than 22.5 indicated fair knowledge, and score of 22.5 and above indicated good knowledge. The total score was 30. A score less than 15 indicated poor knowledge, a score of 15 to less than 22.5 indicated fair knowledge, and score of 22.5 and above indicated good knowledge. Higher score of knowledge indicate good knowledge.

Tool V: Acupressure practice observational checklist

This tool was developed by researcher after training and reviewing literature to ensure that the older adult master the technique of acupressure and practice it correctly. Scoring of the checklist was done using 3-point Likert scale. A score of zero (0) was given when elderly not done. A score one (1) was given when elderly incomplete done. A score of two (2) was given when elderly complete done. A score (2) was given when elderly complete done. The total score of acupressure training was 12. Higher score indicates good practice.

Method

1. The researcher had taken a training course on acupressure under the supervision of specialist trainers in the field of acupressure and physiotherapy. The course lasted for four weeks. It included two parts, theoretical part and practical part. The theoretical part included definition of acupressure, importance of acupressure, difference between acupressure and acupuncture, uses and contraindications of acupressure, and theories of acupressure. The practical training included the precautions that should be used before, during and after applying acupressure, the proper selection of acupoints around knee joint, the technique of thumb pressure, duration of pressure on each acupoint, and the duration needed for each acupressure session. At the end of this course, the researcher had taken a certificate of completion.

2. An official letter was issued from the Faculty of Nursing, Mansoura University and forwarded to the director of the Mansoura University Hospital in order to obtain the approval to carry out the study.

3. Tool I (Structured interview sheet), tool IV (Older Adult's Knowledge Related Knee Osteoarthritis and Acupressure Structured Interview Schedule), and tool V (Acupressure Practice Observational Checklist) were developed by the researcher based on review of relevant literature.

4. The Arabic version of tool II (Western Ontario and McMaster Universities Osteoarthritis scale) and tool III (Hospital Anxiety and Depression Scale) were used. The study tools were tested for content validity by seven experts in the related fields (Gerontological nursing and Medical surgical nursing) and modifications were done accordingly.

5. A pilot study was carried out on 11 elderly patients with knee osteoarthritis (10%) selected from outpatient clinic of rheumatology in Mansoura University Hospital to test and ascertain the clarity, feasibility, applicability of the study tools and the necessary modifications were done accordingly. The elders who included in the pilot study were excluded from the study sample.

6. Each study subject in both the study and the control groups was interviewed individually by the researcher in the examination room of the outpatient clinic starting from 9 am to 12 pm. The researcher used to welcome each patient on admission, ensures that the elderly is seated comfortably, and explain the purpose of the study. Then a verbal consent from each study subject to participate in the study was obtained.

7. The researcher assessed each study subject using the study tools (pre-test). The necessary information took nearly 20-30 minutes. The researcher took the phone numbers of the study subjects to ensure continuous contact.

8. The researcher read each question to the elderly and marked exactly the answer they gave.

9. The proposed intervention was developed by the researcher based on reviewing the related literatures. The proposed interventions included knowledge and practices required for management of elderly patients with knee joint osteoarthritis. It covered items related to the meaning of knee osteoarthritis, causes or risk factors, signs and symptoms, types of management, types of complementary and alternative medicine, definition of acupressure, benefits of acupressure, and mechanism of acupressure. The interventions were prepared and divided to be in 5 sessions.

10. The proposed interventions were conducted individually in the examination room of the outpatient clinic of Rheumatology; covered into five sessions (two sessions for provision of knowledge and three sessions for training), implemented over two weeks.

11. The researcher used to start each session by reemphasizing the important points in the previous session.

12. During each session, an illustrated booklet was used and distributed in order to clarify the knowledge and practices for each elderly. Other teaching methods used were audiovisual material, open discussion, demonstration, re-demonstration and real life demonstration. As well, the researcher used to do phone call in order to answer any questions and clarify any vague points in order to maintain the studied elderly's motivation and give positive feedback and reinforcement.

13. Telephone calls were conducted every one week during the first 6 weeks after implementation of the acupressure intervention for the older adults in the study group to follow the elderly patients' adherence with the acupressure intervention.

14. Immediately after implementation of acupressure training, the elderly patients in the study group were evaluated using tool IV (Older Adult's Knowledge Related Knee Osteoarthritis and Acupressure Structured Interview Schedule), and tool V (Acupressure Practice Observational Checklist) to determine the effect of the training sessions.

15. Evaluation of elderly patients in the study and control group by using tool II (WOMAC), and tool III (HADS) was done after the 6 week and after 12 weeks from the implementation of acupressure intervention.

16. The evaluation of the effectiveness of the proposed intervention was determined by using the proper statistical analysis.

17. Data were collected during a period of 6 months (from the beginning of November 2016 until the end of April of 2017).

Ethical consideration:

- Ethical approval was obtained from the research ethics committee of faculty of Nursing, Mansoura University.
- Privacy of the subjects was assured and confidentiality of the collected data was maintained.
- The study subjects were informed about the right to withdraw from the study at any time.

Statistical analysis:

The collected data were coded, computed and statistically analyzed using SPSS software program version 16.0. The qualitative data were presented as frequency and percentages and the statistical comparison was done using Chi square test (χ2) and Fisher exact test (when any expected cell was less than 5). While, quantitative variables were presented as Mean $\pm$ SD, and the comparisons were done using Student t test for two groups, Paired t test for comparison of the same group at two different periods and one way Anova test (F test) for more than two group. Pearson correlation (r) was used to find out the correlation of two quantitative variables. The difference was considered significant at P $\leq$ 0.05.

IV. Results

Table 1 shows that, the majority of the two groups were young old with the mean of age 64.46±4.10 and 65.85±4.54 years for the study and control groups respectively with no statistically significant difference between the two groups (P=0.067). Females were constituted 67.3% of the study group, and 63.5% of the control group, with no statistical significant differences between the two groups (P=0.680). In the study and control groups, 59.6% and 50% respectively were married, with no statistical significant differences between the two groups (P=0.325). There was no statistical significant difference regarding the level of education (P=0.184), where illiteracy was prevailing among 30.8%, and 44.2% of the study and control groups respectively. Regarding current job, 94.2%, and 86.5% respectively of the study and control groups were not working with no statistical significant differences between the two groups (P=0.183). 92.3% of the study group and 90.4% of the control group reported no enough income, with no statistical significant differences between the two groups (P=0.727). There were no statistical significant differences regarding living condition between the two groups (P=0.334).

Figure 1 shows that, the total mean score of pain in WOMAC scale was improved significantly (decreased) in the study group at 6 weeks post sessions and the improvement maintained at 12-week evaluation (P=0.000), whereas elderly patients in the control group had significant higher score (increased) at 6 weeks and 12 weeks. It should be pointed out that total mean score of pain didn't show any statistically significant difference between study and control groups before implementing the acupressure intervention while the difference between the two groups were statistically significant at both 6 weeks and 12 weeks after the implementation of acupressure intervention.
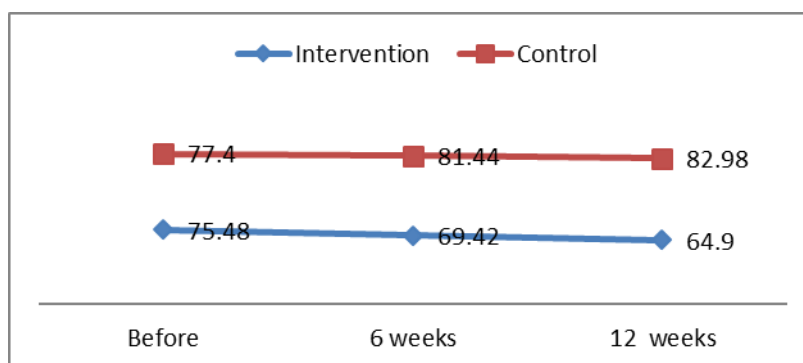
Figure 2 shows that, the total score of stiffness in WOMAC scale was decreased (improved) significantly in the study group at 6 weeks of evaluation and the improvement maintained at 12-week of evaluation (P=0.000), whereas patients in the control group had significant and higher score only at 6 weeks (P=0.019) and the total mean score still higher at 12 weeks but there is no statistical difference (P=0.159). It should be pointed out that mean total score of stiffness didn't show any statistically significant difference between study and control groups before implementing the acupressure intervention while the difference between the two groups were statistically significant at both 6 weeks and 12 weeks after the acupressure intervention implementation.

Figure 3 revealed that, the total mean score of physical function in WOMAC scale was decreased (improved) significantly in the study group at 6 weeks post sessions and the improvement maintained at 12 week evaluation (P=0.000), whereas elderly patients in the control group had significant and higher score only at 6 weeks (P= 0.000) .It should be pointed out that mean total score of physical function didn't show any statistically significant difference between study and control groups before implementing the acupressure intervention while the difference between the two groups were statistically significant at both 6 weeks and 12 weeks after the acupressure intervention implementation.

Table 1: Socio-demographic characteristics of the study and control groups

| Items	Study group		Control group		Test of significance
	N= (52)	%	N=(52)	%	
Age (in years)					
60 –	38	73.1	37	71.2	X^2=0.048
70 - 80	14	26.9	15	28.8	P=0.827
Mean± SD	64.46±4.10		65.85±4.54		t=1.854 P=0.067
Sex					
Males	17	32.7	19	36.5	X^2=0.170
Females	35	67.3	33	63.5	P=0.680
Social status					
Married	31	59.6	26	50.0	X^2=0.921
Widow	21	40.4	26	50.0	P=0.325
Educational level					
Illiterate	16	30.8	23	44.2	X^2=7.525
Read &Write	17	32.7	13	25.0	P=0.184
Basic education	17	32.7	16	30.8	
University	2	3.8	0	0.0	
current job					
Working	3	5.8	7	13.5	X^2=1.770
Not working	49	94.2	45	86.5	P=0.183
Income					
Enough	4	7.7	5	9.6	X^2=0.122
Not enough	48	92.3	47	90.4	P=0.727
Living condition					
Wife/husband	31	59.6	25	48.1	X^2=3.399
Alone	5	9.6	4	7.8	P=0.334
With children	16	30.8	23	44.1	

Significant at P≤0.05

Figure 1: Mean total score of pain in the study and control group before and after the acupressure intervention implementation
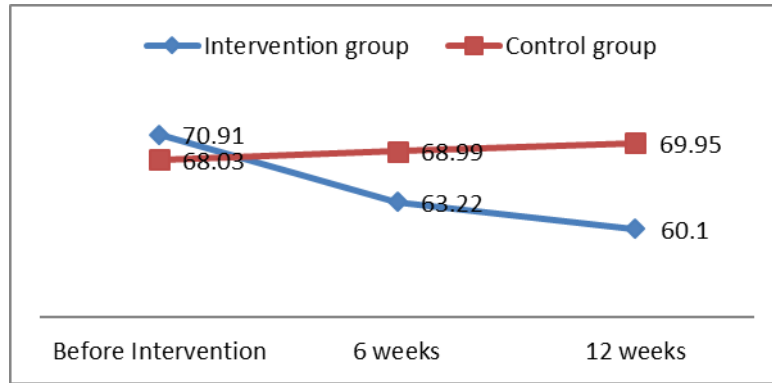
Figure 2: Mean total score of stiffness in the study and control group before and after 6 & 12 weeks of the acupressure intervention implementation
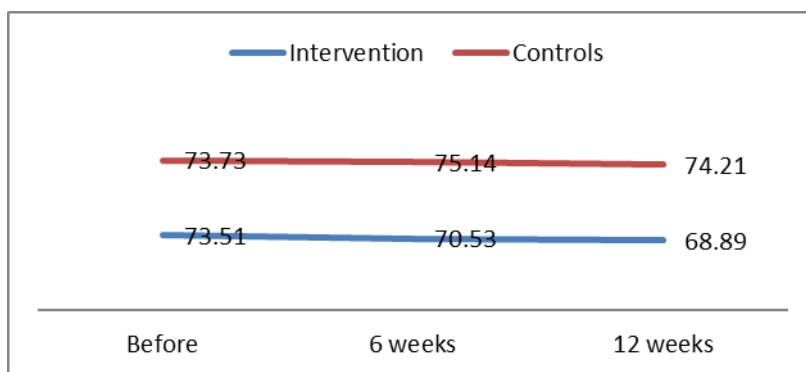
Figure 3: Mean score of physical function in the study and control group before and after the acupressure intervention

Figure 4 shows that, the total WOMAC score was decreased (improved) significantly in the study group at 6 weeks and the improvement maintained at 12 week evaluation (P=0.000), whereas patients in the control group had significant and higher score at 6 weeks and 12 weeks (P= 0.000) .It should be pointed out that total mean score of WOMAC scale didn't show any statistically significant difference between the study and control groups before implementing the acupressure intervention while the difference between the two groups were statistically significant at both 6 weeks and 12 weeks after the acupressure intervention implementation.
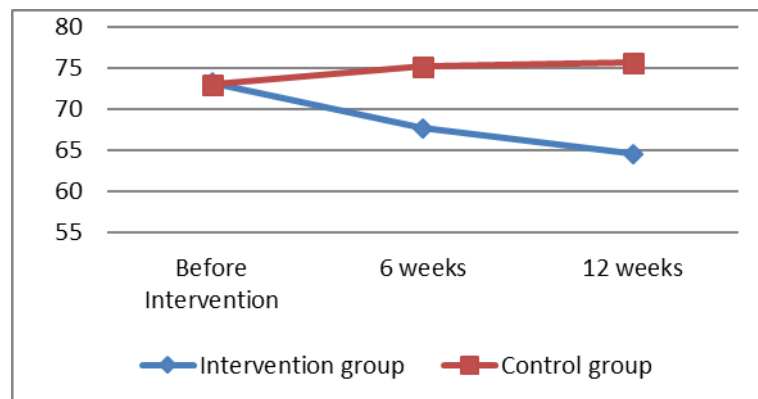
Figure 4: Total mean score of WOMAC scale in study and control group before and after the acupressure intervention implementation

Table 2 shows that, the mean score of anxiety was decreased (improved) significantly in the study group at 6 weeks and the improvement maintained at 12-week evaluation (P=0.000), whereas patients in the control group had higher mean score in both evaluations but there is no statistical difference (P= 0.110, P=0.617). It should be pointed out that average score of anxiety didn't show any statistically significant difference between study and control groups before implementing the acupressure intervention and after 6

weeks while the difference between the two groups were only statistically significant at 12 weeks after the acupressure intervention implementation.

Table 2: Mean score of anxiety of study and control groups before and after acupressure intervention

Items	Study group Mean ± SD	Control group Mean ± SD	Test of significance
Before After 6 weeks After 12 weeks	8.96±1.47 8.36±1.33 7.71±1.30	8.86±1.47 8.75±1.38 8.81±1.47	t=0.334, p=0.739 t=1.445, p=0.151 t=4.024, p=0.000
Paired t test: Before Vs6 weeks Before Vs 12 weeks 6 weeks Vs 12 weeks	t=6.777, p=0.000* t=8.142, p=0.000* t=6.633, p=0.000*	t= 1.629, p=0.110 t=0.503, p=0.617 t=0.622, p=0.537	

*Significant at P≤0.05

Table 3 shows that, the total mean score of depression was decreased (improved) significantly in the study group at 6 weeks post sessions and the improvement maintained at 12-week evaluation (P=0.000), whereas patients in the control group had higher mean score in both evaluations but there is no statistical difference (P=0.742, P=0.212). It should be pointed out that average score of depression didn't show any statistically significant difference between study and control groups before and after implementing the intervention.

Table 3: Mean score of depression of study and control groups before and after acupressure intervention

Items	Study group Mean ± SD	Control group Mean ± SD	Test of significance
Before After 6 weeks After 12 weeks	10.10±2.03 9.37±1.72 8.96±1.66	9.44±1.92 9.42±1.88 9.04±2.60	t=1.685, p=0.095 t=0.163, p=0.871 t=0.180, p=0.858
Paired t test: Before Vs6 weeks Before Vs 12 weeks 6 weeks Vs 12 weeks	t=7.645, p=0.000* t=6.373, p=0.000* t=3.894, p=0.000*	t= 0.330, p=0.742 t=1.264, p=0.212 t=1.223, p=0.227	

*Significant at P≤0.05

Table 4 reveals that, the total score of knowledge of the study group increased significantly immediately after applying sessions (P=0.000), and the improvement was slightly decreased after 6weeks and 12weeksbut remain differ significantly in comparison before sessions (P=0.000). Moreover, the total knowledge scores of control group were slightly increased after 12weeks but the differences were not statistically significant. In addition, there were no statistical significant difference detected between two groups before applying sessions regarding the total score of knowledge. On the other hand, after applying the intervention the differences between the total mean score of knowledge of the study and control groups were statistically significantly.

Table 4: Knowledge of the study and control groups before and after the acupressure intervention

Total knowledge score	Study group Mean ± SD	Control group Mean ± SD	Test of significance
Before sessions	8.40±4.07	8.35±3.74	t=0.075, P =0.940
Immediately after sessions	20.12±3.08	8.36±3.39	t=18.469, P =0.000*
After 6 weeks	17.85±3.29	8.34±3.84	t=13.555, P =0.000*
After 12 weeks	16.75±3.54	8.37±4.09	t= 11.270,P =0.000*
Paired t test:			
Before Vs Immediate	t=37.793, P=0.000*	t= 0.099,P=0.922	
Before Vs6 weeks	t=36.988, P=0.000*	t=0.021, P=0.986	
Before Vs 12 weeks	t=31.037, P=0.000*	t=0.036, P=0.971	
Immediate Vs 6weeks	t=13.212, P=0.000*	t=0.064, P=0.950	
Immediate Vs 12weeks	t= 13.699,P=0.000*	t=0.021, P=0.986	
6 weeks Vs 12 weeks	t=8.460, P=0.000*	t=0.198, P=0.844	

Significant at P≤0.05

Table 5 shows that, the total mean score of practice was improved (increased) significantly in the study group at 6 weeks post sessions and the improvement maintained at 12-week evaluation (P=0.000).

Table 5: The total mean score of acupressure practice in the study group before and after implementing the acupressure intervention

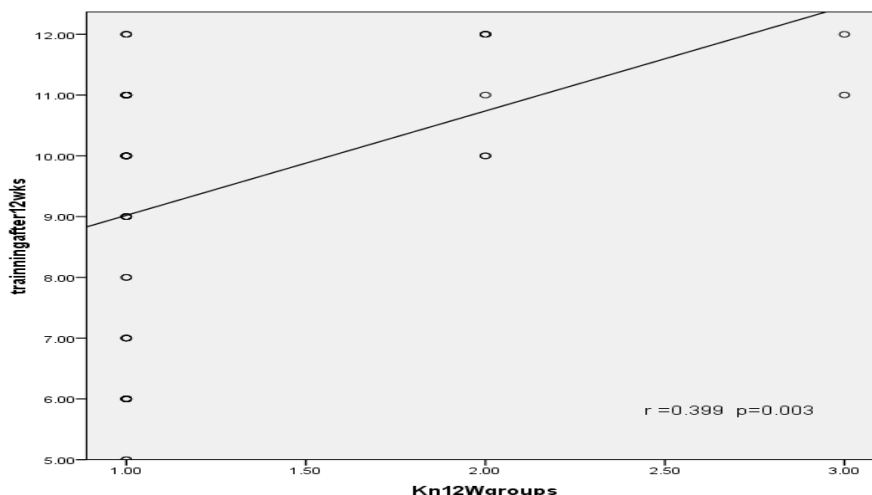| Total practice score	Study group Mean ± SD
Before intervention	0.04±0.28
Immediately after intervention	5.69±0.94
After 6 weeks	7.60±1.44
After 12 weeks	9.38±2.14
Paired t- test:	
Before Vs Immediately	t=46.170, P=0.000*
Before Vs 6weeks	t=40.396, P=0.000*
Before Vs 12weeks	t= 31.891, P=0.000*
Immediately Vs 6weeks	t= 18.359, P=0.000*
Immediately Vs 12weeks	t= 18.729, P=0.000*
6weeks Vs 12weeks	t= 11.634, P=0.000*

Significant at P≤0.05

Table 6 revealed that, there was negative correlation between total WOMAC score and knowledge, while there was significant negative correlation between total WOMAC score and acupressure practice. On the other hand, there was significant positive correlation between total WOMAC score and anxiety, while there was significant positive correlation between total WOMAC score and depression after 12weeks of intervention.

Table 6: Correlation between WOMAC score and knowledge, psychological health status and practice score in the study group

Items	WOMAC 6 weeks		WOMAC 12 weeks	
	r	P	r	P
Knowledge Immediate score	- 0.199	0.156	- 0.174	0.219
Knowledge 6 week score	- 0.140	0.323	- 0.102	0.471
Knowledge 12 weeks score	- 0.185	0.190	- 0.154	0.277
Anxiety score 6 weeks	0.353	0.010*	0.317	0.022*
Anxiety score 12 weeks	0.499	0.000*	0.492	0.000*
Depression score 6 weeks	0.153	0.297	0.089	0.532
Depression score 12 weeks	0.400	0.003*	0.353	0.010*
Training score Immediate	- 0.728	0.000*	- 0.743	0.000*
Training score 6 weeks	- 0.732	0.000*	- 0.766	0.000*
Training score 12 weeks	- 0.751	0.000*	- 0.777	0.000*

Significant at P≤0.05

Figure 5 shows that, there was a strong positive correlation between total knowledge score and total acupressure practices score of the study group at 12weeks after implementation of acupressure intervention.

Figure 5: Correlation between total knowledge and practice scores of the study group at 12weeks after acupressure intervention implementation

V. Discussion

Osteoarthritis is the third most common diagnosis in the elderly causes significant pain leading to disability and decreased quality of life in subjects 65 years and older. [33] Acupressure is one strategy used in management of knee osteoarthritis and have a positive impact on the physical function of elderly patients with knee osteoarthritis and also improves the emotional disturbance and psychological wellbeing [22,34,35]. Regards to socio-demographic characteristics of the study subjects, the majority of elderly in both the study and control groups are young old. On the same line, a study done in Ireland by **French et al, (2015)** [36] reported the majority of the study subjects were young old. In contrast a study carried out in the city of Birmingham by **Singh et al, (2014)** [37], who reported that most of the study subjects were middle old. This finding may be explained by elderly people in this age group may still have more responsibilities and have more ability to seek services of the outpatient clinics compared to middle old and old-old. Females were more prevalent in the study than males. This finding is consistent with that of other studies carried out by **Kawano et al (2015)** [38] in Brazil, **Ganasegeran et al, (2014)** [39] in Malaysia and **Hana et al (2017)** [40] in Tunisia who reported that, knee osteoarthritis was found to be significantly associated with female sex. This may be due to hormonal change especially after menopause that may increase the risk of having knee osteoarthritis. Regarding the elderly education level, nearly one half of the subjects in both groups were illiterate. These results are supported by **Park et al, (2017)** [41] in Korea, who found that the low education was significantly related to osteoarthritis. This may be related to the low education may result in poor knowledge about disease and measures of management.

Regarding physical health status of the elderly with knee joint osteoarthritis. The total mean score of WOMAC which include pain, stiffness, and physical function for study and control groups, the findings of the present study showed that there was no statistical significant difference between the total mean score of WOMAC for the study and control groups before acupressure intervention implementation. While the total mean score of WOMAC was decreased (improved) significantly in the study group after 6weeks and 12 weeks of acupressure intervention implementation compared to the control group. This is supported by a study conducted in Egypt by **Sorour et al, (2014)** [35] who revealed that there was significant improvement in the total WOMAC scores in the study compared to the control group. This result may be related to the effectiveness of acupressure intervention sessions which provides elderly patients with the necessary information and precautions that should be considered to master the technique of self-administered acupressure.

The escalating nature of knee osteoarthritis(KOA) can lead to psychosocial deterioration in addition to physical inability, which makes it difficult to interpret the source of the patients' complaints (**Abd El Monaem et al, 2017**) [42]. The present study revealed a significant improvement in the level of anxiety of the study group after implementation of acupressure intervention. These findings in harmony with other studies such as a study

done by Honda et al, 2013 in Japan who stated that a single session of self-administered acupressure can significantly reduce the level of anxiety, and another study conducted in Iran by **Beikmoradi et al, (2015)** [43] who revealed that performing acupressure significantly decreased mean score of anxiety. This result may be explained by the improvement in pain and physical function due to acupressure intervention, consequently leads to improvement in anxiety level, also the application of acupressure intervention may provide relaxation and decrease the activity of sympathetic system, that in turn reducing level of anxiety. Depressive symptoms are common among patients with knee osteoarthritis and it can lead to reduced physical activity, more disability, and poor outcome **(Stubbs et al, 2016)** [44]. The present study revealed a significant improvement in the level of depression of the study group after implementation of acupressure intervention. These findings in accordance with a study in Korea done by **Kim et al, (2016)** [45] who revealed that there was a significant reduction in depression symptoms after 4 weeks of manual acupressure intervention compared to pre intervention. This may be attributed to improving pain and physical function after acupressure intervention, resulting in increasing ability to perform activity of daily livings and decreasing dependence on others and consequently decreasing feeling of depression.

The findings of the present study showed that there was no statistical significant difference was found in the total mean score of knowledge for the study and control groups before acupressure intervention implementation. This may be explained by most of elderly patients especially in developing countries are unfamiliar with this type of complementary and alternative medicine. Also the current study revealed a significant improvement in the knowledge of the study group after implementation of acupressure intervention sessions. These findings in accordance with a study carried out in Sweden by **Hansson et al, (2010)** [46] who concluded that patient education in patients with osteoarthritis is feasible in primary health care setting and improve self-perceived health and function. This result may be related to effectiveness of acupressure intervention sessions which provide elderly patients with the necessary information about osteoarthritis and acupressure. Unexpectedly, there was slightly improvement in knowledge among the control group. On the same line a study done in Egypt by **El-Olemy et al, (2017)** [47]. This may be justified by effect of mass media that provide public with necessary information about disease and management, or it may be related to proper instructions provided by health care providers during follow up visits.

The results of the current study showed significant improvement in practicing the acupressure on knee joint among the subjects in the study group immediately after the intervention with a statistically significant difference was found between the study and control groups. This difference is still significant after 6 and 12weeks of evaluation. This is in accordance with a study carried out in Egypt by **Ali et al, (2016)** [48] who revealed a significant improvement in knowledge and training of the study group after the implementation of the training sessions. This finding may be attributed to acquiring knowledge about disease and acupressure during intervention, providing with necessary considerations to master the technique of self- administered acupressure, and effectiveness of applying acupressure on the knee joint to the elderly patients.

The present study revealed that there was significant negative correlation between total WOMAC score and acupressure total practice score. This means that, proper acupressure practice results in lowering the total WOMAC score. This finding in line with a study in Texas, USA done by **Zhang et al, (2012)** [22] who concluded that self –administered acupressure intervention on knee joint, resulting in lowering the total WOMAC score. On the other hand, there was significant positive correlation between total WOMAC score and anxiety, while there was significant positive correlation between total WOMAC score and depression after 12weeks of intervention. This in agreement with a study carried out by **Hirschman et al, (2013)** [49]**, Axford et al, (2010)** [50]**, Hawker et al, (2011)** [51]**, Sharma et al, (2016)** [52] who revealed that patients with inferior depression and anxiety showed poorer score of WOMAC, in addition pain leads to depressed mood through its effect on disability. In contrast a study done in Australia by **Phyomsung et al, (2014)** [53] revealed that strong relationship between depression and knee pain while there was no association between anxiety and knee pain. Concerning the correlation between total knowledge score and total practices score of acupressure in the study group, the current study revealed a strong positive correlation between total knowledge score and total acupressure practice score of the study group at 12weeks after implementation of acupressure intervention. This result in line with **El-Olmey et al, (2017)** [47] in Egypt who concluded that good knowledge about Complementary and Alternative Medicine (CAM) was often associated with high use of CAM. In this study it can be said that, the implementation of acupressure intervention proved to be effective in improving the physical and psychological health status of the elderly patients who received the study intervention. The research hypothesis of the present study approved and came true. The research study can be considered as the start point and initiation of provision of education and training on self-administered acupressure on elderly patients with knee joint osteoarthritis in order to reduce pain and improve coping with this chronic disease.

VI. Conclusion and Recommendations

In this study implementation of the developed acupressure intervention program proved to be effective in improving knowledge and practices of the elderly with knee osteoarthritis. A significant improvement in the physical health status (WOMAC total mean score) and psychological health status (Anxiety and depression total mean score) of the study group was found after the implementation of acupressure intervention program. A statistically significant difference was found between study and control groups in physical and psychological health status of the elderly after the implementation of acupressure intervention program. Moreover, a significant negative correlation was found between the physical health status and total mean score of practices and a significant positive correlation was found between the physical and psychological health status among the subjects in the study group.

Recommendations
- The developed illustrated acupressure intervention booklet to be distributed to elderly patients in Mansoura university hospitals rheumatology outpatient clinics through the responsible personal to raise their knowledge and practices.
- Development and implementation of acupressure training program for nurses, health care personals and caregivers about acupressure based on their assessment to fulfill their needs.

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